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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/782,142

02/19/2004

Kelly Brian Cameron

BP3448

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12/01/2005

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EXAMINER

CHASE, SHELLY A

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/782,142	Applicant(s) CAMERON ET AL.	
	Examiner Shelly A. Chase	Art Unit 2133	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-32 is/are allowed.
- 6) ☒ Claim(s) 1-25 and 33-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.


### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
**SHELLY CHASE**  
**PRIMARY EXAMINER**

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2-19-2004</u> | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1 to 35 are presented for examination. Receipt is acknowledged of the preliminary filed 8-25-2004.

#### ***Information Disclosure Statement***

2. The references listed in the information disclosure statement submitted on 7-18-2005 have been considered by the examiner (see attached PTO-1449).

#### ***Claim Rejections - 35 USC § 112***

3. Claims 11, 18, and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 is indefinite because the claim recites the limitation "within a communication device" it is unclear if the claim includes the communication device or the claim is merely reciting intended use. Claims 18 and 25 are similar to claim 11 and are also rejected under 35 U.S.C. 112 second paragraph.

#### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 to 25 and 33 to 35 are rejected under 35 U.S.C. 101 because

Claims 1, 12 and 19, although the claims state a decoder in the preamble, the claims as presented appears as a decoder with a series of functional blocks with their intended functionality and does not refer to a hardware per se. Therefore the claims are directed to software rather than hardware.

Claim 33 appears to be directed to a mathematical process and thus it is an abstract idea.

### ***Allowable Subject Matter***

5. Claims 26 to 32 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art made of record teaches a decoding device or a decoding method for decoding low density parity check (LDPC) codes using a logarithmic correction factor for computing updates; for instance, Mao et al. (*A new schedule for decoding low density parity-check codes*, IEEE), discloses a decoding algorithm that uses the sum-product belief propagation scheme in decoding LDPC codes. Xiao-Yu Hu et al., (*Efficient implementations of the sum-product algorithm for decoding LDPC codes*, IEEE), discloses iterative decoding of LDPC in the log likelihood domain wherein the log likelihood ratio (LLR) for a random variable is computed, check node updates are computed for each node  $m$  and a  $\max^*$  operation is performed for the computed updates. Achilleas Anastasopoulos (*A comparison between the sum-product and the min-sum iterative detection algorithm based on density evolution*, IEEE) discloses different decoding methods for decoding LDPC codes.

However, the prior art made of record taken alone or in combination fails to teach or fairly suggest or render obvious the novel element of the instant invention.

Specifically, the prior art made of record fails to teach or fairly suggest updating the plurality of edge messages with respect to a plurality of bit nodes within the LDPC bipartite graph that corresponds to the LDPC codes using the "Min (dagger minus)" processing.

### ***Conclusion***


6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Xiao-Yu et al. (Progressive edge-growth Tanner graphs) discloses constructing the Tanner graph for LDPC codes with the established edges determined between the symbol and check nodes.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelly A. Chase whose telephone number is 571-272-3816. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**SHELLY CHASE**  
**PRIMARY EXAMINER**